Model 712 Cable Crash Beam Vehicle Barrier

INSTALLATION MANUAL

B&B ARMR

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MADE IN THE USA

INTRODUCTION

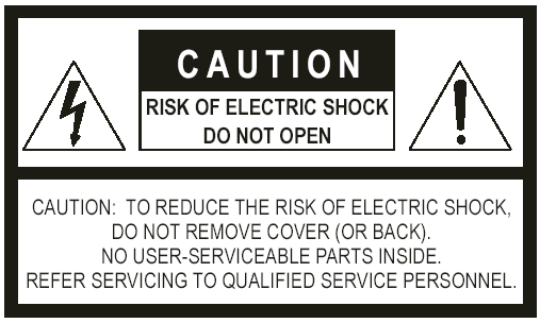
Welcome!

Congratulations on your purchase of a B&B ARMR vehicle barrier. In addition to providing detailed operating instructions, this manual describes how to install, maintain, and troubleshoot your vehicle barrier. If you require additional assistance with any aspect of your vehicle barrier's installation or operation, please contact us.

With years of experience in all aspects of perimeter security and related disciplines, our products are used throughout the world to control access and to protect people, equipment, and facilities. We offer a broad range of vehicle barrier and related security services:

- Turnkey installations
- Routine barrier preventative maintenance or emergency repairs (including work on non-B&B ARMR products)
- Spare or replacement parts
- Custom designs or special installations
- Equipment upgrades (modernize your old equipment with state-of-the-art hydraulics and control systems)
- Ancillary security equipment such as security guard enclosures, card readers, security lighting, and many other security related products.
- Technical support via telephone and possible on site support with advanced scheduling.

Safety


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

SYMBOL MEANING:

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of non-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instruction in the literature accompanying the product.

B&B ARMR does not assume responsibility for injury to persons or property during installation, operation, or maintenance. As the user, you are responsible for correct and safe installation, operation, and maintenance of this equipment. Users must follow the specific instructions and safety precautions located in this manual. In addition they must: Follow the safety standards of the Occupational Safety and Health Administration (OSHA), as well as other applicable federal, state, and local safety regulations and industry standards and procedures. For installation outside the United States, users must also follow applicable international, regional, and local safety standards.
Engage only trained and experienced staff to install, operate, and maintain the equipment. Ensure that all repairs are performed correctly, using properly trained technicians and the correct tools and equipment.

Additional safety devices may be included with this barrier system:

- Vehicle loop detector(s) – Safety loop
- Traffic arms
- Traffic lights

Warranty

B&B ARMR vehicle barriers are guaranteed against defects in materials and workmanship for one year. The warranty applies when the barrier is installed, operated, and maintained according to the instructions in this manual, and when it is operated within the service conditions for which it was specifically sold. The user must prevent potentially damaging conditions, such as mechanical overloading or unauthorized modifications. In the event of a malfunction during the warranty period, contact B&B ARMR and we will pursue prompt corrective action.

This is a warranty summary only. The specific warranty supplied with your equipment is the governing document.

How to Contact Us

If you have any questions or experience any problems with your vehicle barrier, or if we can help you with any other facility security issues, please contact us:

Corporate/Tech Support:
B&B ARMR
2009 Chenault Drive Suite 114
Carrollton, TX 75006 USA
Telephone: (972) 385-7899
Toll Free: (800) 367-0387
Fax: (972) 385-9887
E-mail: **info@bb-armr.com**
techsupport@bb-armr.com

System Installation Record

To assist in documenting the products installed in your system, please take a minute to record the following reference information. This information can be located on the blue B&B ARMR model number plate located on the product in the cylinder access area.

Additional columns are added for your convenience in documenting other components in the system.

Site:			
Job #:			
Date:			
Serial Number:			
Model Number:			
Voltage:			
Phase:			

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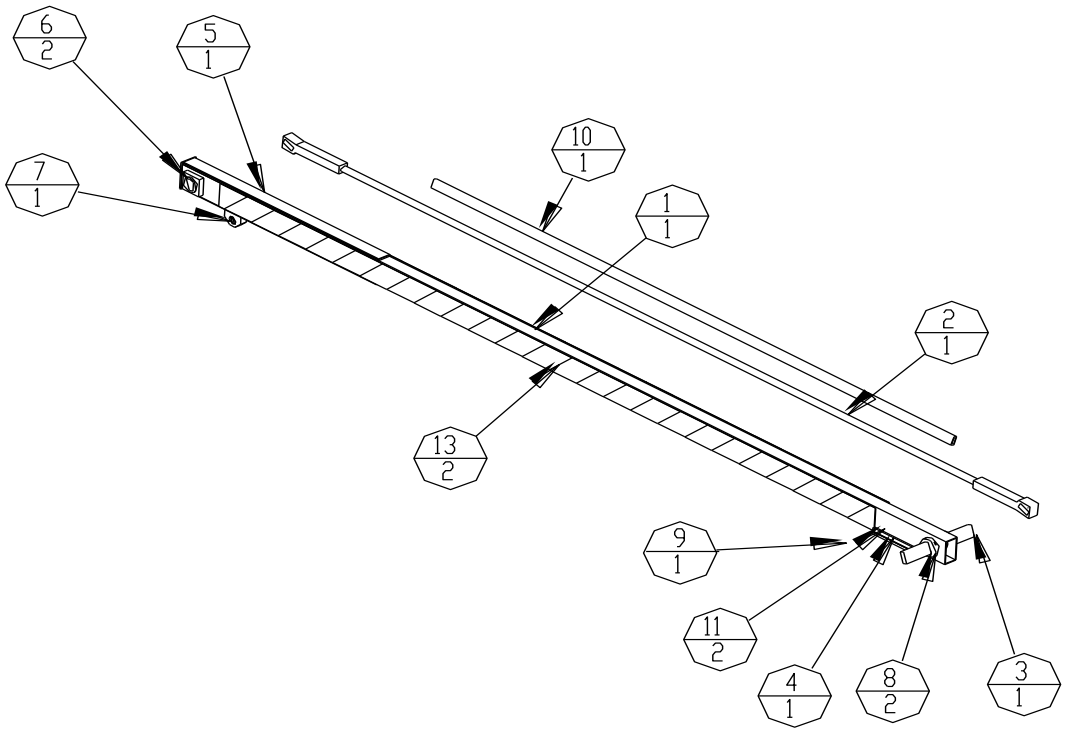

QTY	FIND NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	NOTES
4	14	XTIE-7130K42	CABLE TIE, 6.375 LG, BLACK	
2	13	XTAPE-RED-WHITE	REFLECTIVE TAPE, RED/WHITE, ANGLED	
1	12	XTAPE-76675A23	ADHESIVE TAPE, DOUBLE SIDED, 3M VHB	
2	11	XSCR-91771A194	FHP, 8-32 X .5, SST	
1	10	XINS-3W192	INSULATION, PIPE, .875" ID, 1.5" OD	
1	9	XFOAM-86375K153	FOAM PAD, 3/8 THK, ADHESIVE BACK	
2	8	XCOLLAR-32ALUM	2" DIA, LOCKING COLLAR	
1	7	XBRG-EP162016	BEARING-1X125X1	
2	6	XBRG-EF323632	BUSHING, 2X2.25X2	
1	5	0712-3050	RUBBER PAD STEEL SLEEVE	
1	4	0712-3032	712/714 GATE ARM DELRIN PADS	
1	3	0712-3031	RECEIVER PIN MODEL 712-CRASH GATE	
1	2	0712-3018	STEEL CABLE	
1	1	0712-2025	GATE ARM WELDMENT STEEL SLEEVE	

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1. ORIENTATION

1.1 Overview

The formal name for this vehicle barrier—illustrated on the cover of this manual—is the *B&B ARMR Model 712 Cable Crash Beam*. It is a beam-type barrier hinged at one side so that the beam can be raised and lowered to restrict and control vehicle access. The beam is reinforced with an interior steel cable, which significantly increases the barrier's vehicle stopping power (see specifications below).

1.1.1 Beam

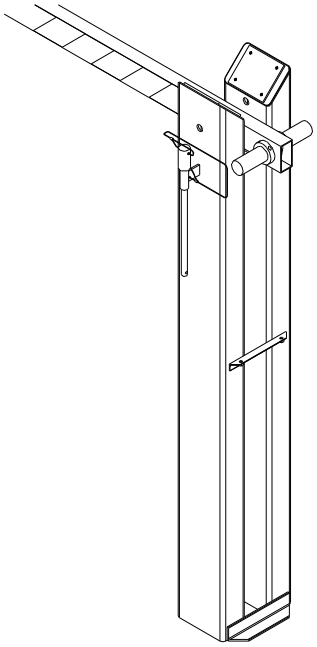
The beam is a rectangular aluminum extrusion. The beam retains its mill aluminum finish and is marked with red and white safety tape. The steel cable is contained inside the beam and anchored with two stainless steel rods at either end. These rods hold the cable during vehicle impact. The cable and its anchor rods substantially increase the barrier's stopping power compared to a beam barrier without these components. The impact energy is absorbed first by stretching the cable, and then the energy is transferred to the foundation through the hinge and receiver assemblies.

1.1.2 Posts

The hinge and receiver posts are steel. The hinge post operates with internal bearings on a stainless steel axle that allows the beam to move in an arc of 85°-87°. The receiver post has a stanchion constructed of two steel weldments. The weldments direct and capture the beam when it is lowered, and securely contain the beam during a vehicle impact. The receiver post has a security latching pin that can be padlocked to prevent unauthorized operation when the barrier is unattended (see Figure 1-1 below).

The barrier has a self-contained, exterior-mounted, automatic damping device. When the barrier operates at the design speed, this damper reduces any whipping action by the beam as it comes to the full, raised position.

Figure 1-1: Receiver Post Stanchion and Security Latching Pin



Both the hinge post and receiver post are cast in place in a subterranean concrete pour. Both posts have elevation grade locators to aid the installation. The installation requires no above-grade concrete. The portions of the hinge and receiver posts that are imbedded are coated to prevent deterioration due to cement contact. The aboveground portions of the posts are primed and finish painted in black.

1.1.3 Hydraulic System & Controls

The 712 barrier operates with a complete, self-contained hydraulic unit. It contains not only the hydraulic components, but also the electrical components and a programmable logic controller that is pre-programmed with the barrier's operating logic. The unit has a minimum 1.5 horsepower, 208 / 240-480 volt, three-phase motor. (A single-phase motor is available on special order.) An overload circuit protects the motor in the event of power fluctuations. The control unit is 120-volt, single-phase with 24-volt dc output.

The motor powers a hydraulic pump that delivers oil through a series of valves as directed by the control unit. If the beam is in the up position for extended periods, the control circuit monitors any drift in the beam's position and automatically corrects the position. The unit includes a manual operation override so the beam can be raised and lowered during power outages.

The hydraulic unit is in an aesthetically pleasing round enclosure with built-in environmental controls, including a heater and cooling fan. (An optional heating unit for

extreme winter conditions is available.) The unit has a built-in 120-volt convenience outlet (customer supplies power to outlet) and a master switch turns off all the power to the unit for maintenance and repairs.

1.2 Options

The *B&B ARMR Model 712 Cable Crash Beam* is available with the following options. Consult your purchase order or other ordering documentation to determine whether your unit has the optional equipment.

- Manually operated hydraulic unit (these units are designated as Model 714)
- Single-phase hydraulic pump motor
- Hydraulic unit heater for extreme cold weather operation
- Various control panel options (touch screen panels, multiple panels, and so on)
- In-ground loop detector to detect the presence of a vehicle and prevent accidental lowering of the beam onto the vehicle
- Traffic lights (red and amber stop/go lights to signal the vehicle)
- Lights (LEDs) on the beam to increase the beam's visibility
- Receiver post heater
- Electromagnetic Lock

1.3 Specifications

Key specifications for the *B&B ARMR Model 712 Cable Crash Beam* are as follows.

- Meets or exceeds US Navy Specification OR098-09-88
- Certified vehicle-stopping power is 10,000 pounds at 18 mph.

2. INSTALLATION

2.1 Introduction

The Model 712 is designed for quick and easy installation. However, every site is different and each Model 712 will vary due to the choice of options or special design features. Accordingly, the instructions below may have to be varied slightly for your particular installation. If you need help, or are unclear about any of these instructions, please contact B&B ARMR for assistance.

Your safety is extremely important to us. Be sure to follow the specific instructions presented below. You are responsible for the correct and safe installation, operation, and maintenance of this equipment.

2.2 Preliminary Considerations

Before beginning site excavation and barrier installation, note the following important considerations.

- Inspect the site and verify there are no underground utilities or overhead wires or obstructions in the excavation area.
- If possible, locate the installation away from routine foot traffic to reduce the chance for pedestrian injury from the barrier's moving arm.
- If your site layout requires the hydraulic pumping unit be placed more than 4' from the barrier's hinge post, the hydraulic hose supplied will be too short. Contact B&B ARMR and we will help you determine the correct hose length.

2.3 Installing the Hinge and Receiver Posts

Perform the following steps.

2.3.1 Excavate the hole for the hinge post as shown in the engineering drawing titled *Model 712 Cable Crash Beam Suggested Conduit layout* (see the Installation Drawings section at the end of this manual). Place supporting timbers over the excavation and parallel to the roadway. Place the hinge post in the excavation supported by these timbers, using the grade locators on the post to ensure the hinge post is set to the proper depth. There are 3/8" nuts welded to the grade locators (can be viewed in Detail A on same foundation drawing mentioned above). Insert all-thread in these nuts and through the supporting timbers and use the all-thread to adjust the hinge post so it is plumb and level.

2.3.2 Place string lines on either side of the hinge post and run the lines across the roadway to determine the receiver post location. Keep the string lines parallel and accurately measure the *clear opening length*. This length (see *Model 712 Cable Crash Beam 12' Clear Opening* drawing for reference) is the distance between the inside (side facing the road) faces of the hinge post and the receiver post. Once the receiver post location is determined, excavate the receiver post's hole and position and plumb the receiver post as described above.

2.3.3 Verify the posts are positioned correctly by running a string line between the two. Pull the string from the center of the hinge post and perpendicular to the axle and verify it falls directly on the center of the receiver post, and the distance between the two is exactly the specified clear opening length for your barrier.

2.4 Installing the Conduit

Perform the following steps, to install the conduit for the power, hydraulic lines, and control circuits, referring to the *Submittal* or drawing titled *712 Cable Crash Beam*

Suggested Conduit layout (see the Installation Drawings section at the end of this manual).

2.4.1 The installation requires a minimum of three conduits. One 2" diameter PVC conduit for the hydraulic lines, one ¾" diameter PVC conduit for the power cables, and one ¾" diameter PVC conduit for the control cables. One 3" diameter PVC conduit for the hydraulic lines would be required if the runs exceed 25'. All conduits, fittings, sweeps, and couplings must be electrical grade (gray color); do not use plumbing type (white color). Additional conduits may be required for traffic lights, loop detectors, and other options. Contact B&B ARMR if you are unclear about the conduit requirements for your installation.

2.4.2 All conduits are run to the hydraulic pump unit, where they will enter the unit through a common 17" diameter opening. Accordingly, run all the conduits for your installation to the location where the hydraulic unit's concrete pad will be located. This pad is typically placed so that the centerline of the hydraulic unit is 4' from the back of the hinge post, though your installation may require that the pad be located a different distance from the hinge post. (Not closer than 3' unless the unit is off to one side.) Run the conduits together and be sure the conduits are long enough to extend above the anticipated height of the hydraulic unit's pad.

2.4.3 After installing the conduits, verify that the hinge and receiver posts have not moved by repeating step 2.3.3 above.

2.5 Emplacement

2.5.1 Fill the hinge post and receiver post excavations with concrete and finish the concrete surface. Remove any splattered concrete from the posts. Verify the posts did not move out of alignment during the pour by repeating step 2.3.3 above. Allow the concrete to cure.

2.5.2 Pour the pad for the hydraulic unit, and finish the concrete surface. Remove any concrete that might have splattered inside the exposed conduits. Allow the concrete to cure.

2.6 Hydraulic Unit Installation

Refer to the Submittal or the HPU user manual.

2.6.1 Place the hydraulic unit on the pad over the exposed conduits and bolt the unit in place. (The feet on the unit will accept standard concrete anchors.) If you mount the unit to an intermediate steel structure, make sure that structure is securely fastened to the pad.

2.6.2 Terminate the electrical conduits in the electrical box and the hydraulic hose conduit onto the JIC fittings. The hydraulic conduit should not extend above

the height of the unit's internal ring. This will allow the hydraulic hose to move slightly when pressure is applied without rubbing against any sharp edges on the conduit.

2.6.3 Install the hose by pulling it into the conduit, making sure to protect the hose from any sharp edges. When you cut the hose to length do not cut it too short, as the hose will shrink slightly in length when under pressure.

2.6.4 Connect the “up” hose fitting to the bottom of the flow control valve and connect the “down” hose fitting to the left side of the pump at the tank breather.

2.6.5 After connecting the hose at the pump you must purge air from the cylinder and lines. **Verify the motor power is OFF**. Hand-crank the motor clockwise until oil comes out of the hose. Stop cranking and terminate the hose on the bottom fitting of the hydraulic cylinder. Terminate the breather line on the top fitting of the hydraulic cylinder.

2.7 Control System Installation

For this section, refer to the HPU user manual that came with the unit for more details. +

Install three-phase or single-phase power (as appropriate to your Model 712) to the upper left corner of the electrical box. For three-phase systems use the terminals marked L1, L2, L3, Neutral, and Ground. For single-phase 220-volt systems use the terminals marked L1, L2, Neutral, and Ground. And for single-phase 120-volt systems use the terminals marked L1, Neutral, and Ground.

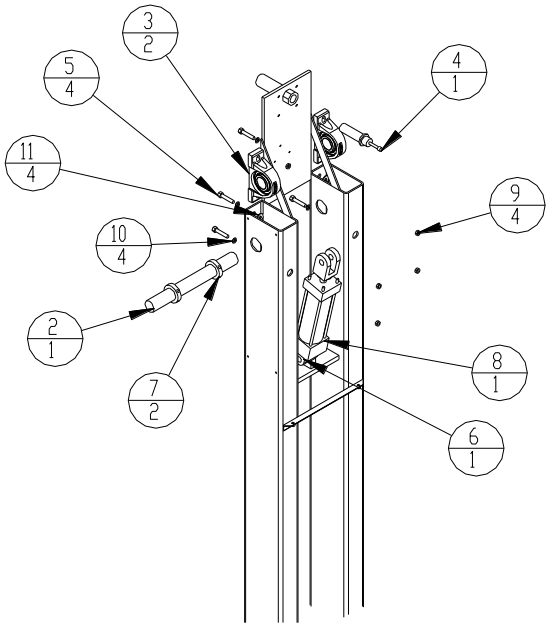
All devices that require AC power (such as the loop detector, radio remote, traffic light, and infrared beam) can get 120-volt AC from the upper left side of the electrical cubical. Most other wiring is low-voltage (24-volt dc). Terminate all low-voltage inputs on the orange terminal blocks at the top of the electrical box. Wire all switching devices (barrier up, barrier down, limit switch, and so on) so that each device gets 24-volt dc positive power from the red terminal blocks. Attach each device's input termination point wire to the appropriate terminal block as referenced in the HPU user’s manual

2.8 Final Installation Steps

2.8.1 Attach the beam to the hinge post using the stainless steel axle, sliding the axle through the flange-mounted bearing, through the bronze bushing on the beam, and into the second bearing. Use the setscrews on the bearings to lock the axle in place. In addition, there are shaft collars on either side of the beam. Tighten these collars on the sides of the beam not the stanchion posts, to lock the beam in place.

2.8.2 Attach the hydraulic cylinder to the hinge post and the beam using the clevis pins provided.

2.8.3 If ordered, the 6120 HPU oil tank is shipped with the required amount of. (The tank holds 2 gallons.). If it becomes necessary to add hydraulic oil, add the oil through the oil vent assembly. (See the *Maintenance* section for oil specifications and additional details.)



4	11	XWASH-98026A033, MCMASTER	WASHER, FLAT, 1/2 SCREW, .120" THK
4	10	XWASH-92146A033, MCMASTER	WASHER, LOCK, 1/2 SCREW, .125" THK
4	9	XNUT-91847A520, MCMASTER	HEX NUT, SST, 1/2"-13
1	8	XCYL-HYD3X10, CROSS 310DB	CYLINDER, 3X10
2	7	XCOLLAR-32ALUM, MCMASTER 6436K76	2" DIA, LOCKING COLLAR
1	6	XBRG-EP162016	BEARING-1X125X1 XBRG-EP162016
4	5	XBOLT-92240A722, MCMASTER	HEX BOLT, SST, 1/2-13 X 2.5" LG
1	4	XABS-67DP, MCMASTER 9530K54	SHOCK ABSORBER, 1.375 DIA, 2" STROKE
2	3	1701-0200, SKF SY2.TF	PILLOW BLOCK BEARING, 2" SHAFT
1	2	0712-3022	PIVOT AXLE MODEL 712-CRASH GATE
1	1	0712-2011	HINGE WELDMENT ASSEMBLY MODEL 712-CRASH GATE

Figure 1.2 Drive Stanchion Assembly.

3. TROUBLESHOOTING

The table below provides guidance on identifying and correcting any problems with your *B&B ARMR Model 712 Cable Crash Beam* vehicle barrier. If you encounter problems that you cannot fix, contact B&B ARMR and we will gladly work with you to correct them.

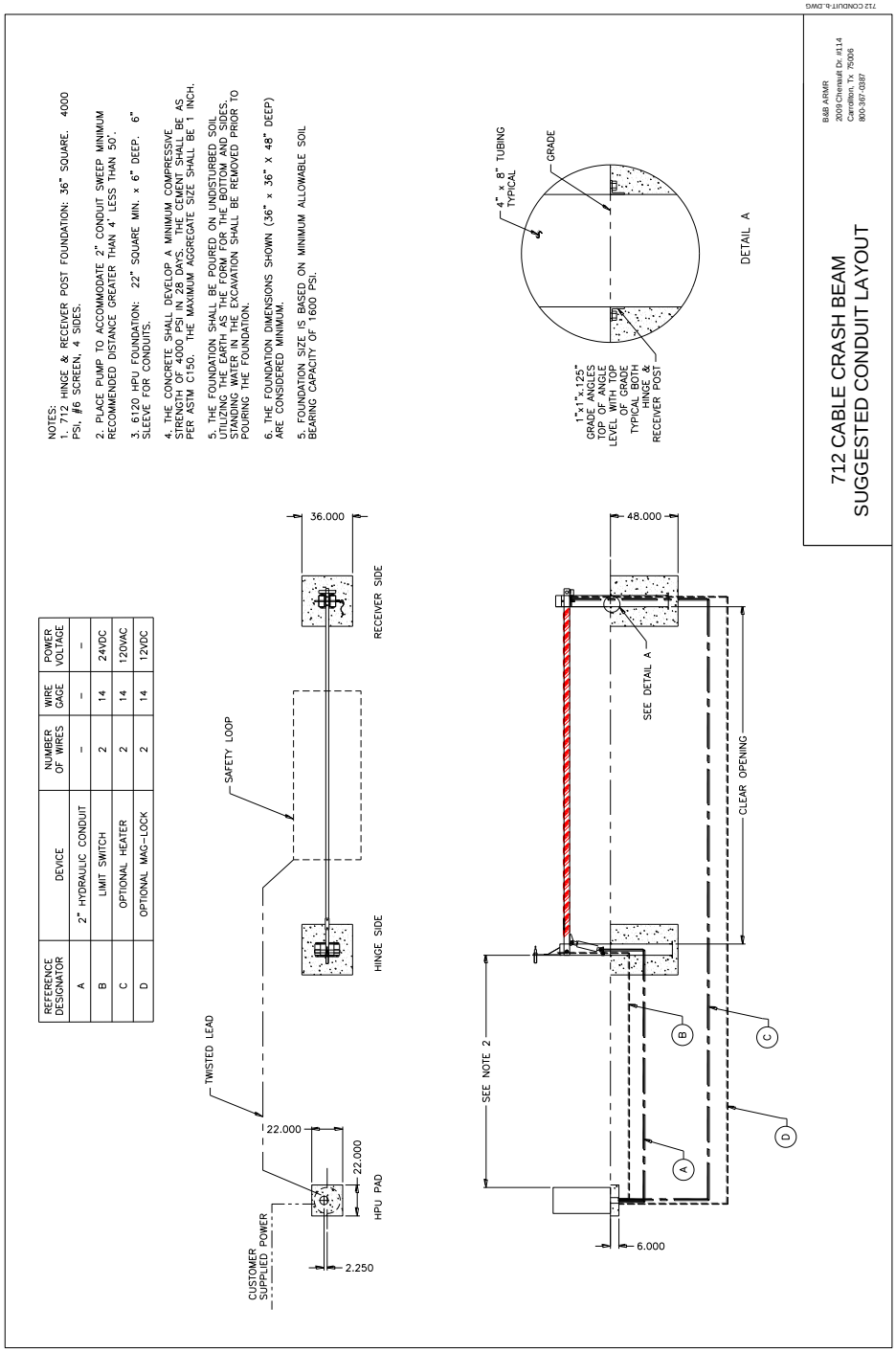
Model 712 Troubleshooting Guide

Symptom	Actions
Beam arm does not go up	1. Check power 2. Check overload protector 3. Check PLC input 4. Check that safeties are clear 5. Check PLC output 6. Check push button operation
Beam arm does not go down	1. Check power 2. Check overload protector 3. Check PLC input 4. Check that safeties are clear 5. Remove manual clock 6. Check cartridge valve operation 7. Check PLC output 8. Check push button operation
Beam arm whips excessively	1. Check limit switch adjustment 2. Check that dampening piston works and is adjusted properly
Beam arm makes noise	1. Check that bearings are greased 2. Check that beam arm is not moving too fast
Unit is excessively hot	1. Check that cooling fan is working 2. Check that the cover is on properly 3. Check that the limit switch is turning the motor off (not time) 4. Check the heater element

Symptom	Actions
Beam arm moves slowly	1. Check that heater element is working 2. Check flow control valve
Traffic indicator light does not change	1. Check proper limit switch operation 2. Check bulbs 3. Check PLC outputs
Beam arm strikes receiver post	6. Check that strike pads are present 7. Check that hinge and receiver post are aligned correctly

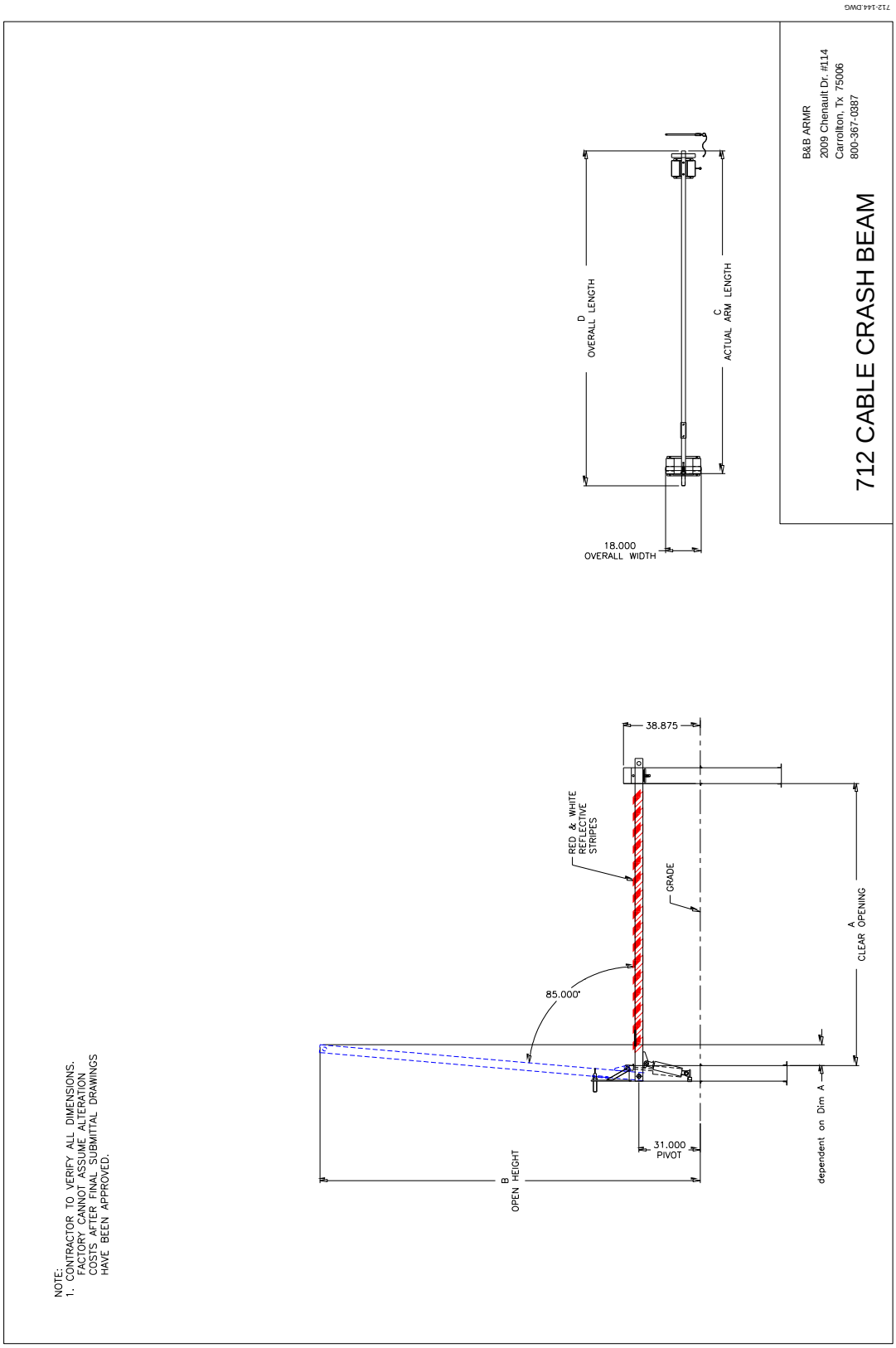
4. ENGINEERING DRAWINGS

4.1 Suggested Conduit Layout


712 CONDUIT-B.DWG
B&B ARMR
2009 Chenault Dr. #114
Carrollton, Tx. 75006
800-367-0387
712 CABLE CRASH BEAM
SUGGESTED CONDUIT LAYOUT
NOTES:
1. 712 HINGE & RECEIVER POST FOUNDATION: 36" SQUARE. 4000 PSI, #6 SCREEN, 4 SIDES.
2. PLACE PUMP TO ACCOMMODATE 2" CONDUIT SWEEP MINIMUM RECOMMENDED DISTANCE GREATER THAN 4' LESS THAN 50'.
3. 6120 HPU FOUNDATION: 22" SQUARE MIN. x 6" DEEP. 6" SLEEVE FOR CONDUITS.
4. THE CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI IN 28 DAYS. THE CEMENT SHALL BE AS PER ASTM C150. THE MAXIMUM AGGREGATE SIZE SHALL BE 1 INCH.
5. THE FOUNDATION SHALL BE POURED ON UNDISTURBED SOIL UTILIZING THE EARTH AS THE FORM FOR THE BOTTOM AND SIDES. STANDING WATER IN THE EXCAVATION SHALL BE REMOVED PRIOR TO POURING THE FOUNDATION.
6. THE FOUNDATION DIMENSIONS SHOWN (36" x 36" X 48" DEEP) ARE CONSIDERED MINIMUM.
5. FOUNDATION SIZE IS BASED ON MINIMUM ALLOWABLE SOIL BEARING CAPACITY OF 1600 PSI.
4" x 8" TUBING TYPICAL
GRADE
1"x1"x.125" GRADE ANGLES TOP OF ANGLE LEVEL WITH TOP OF GRADE TYPICAL BOTH HINGE & RECEIVER POST
DETAIL A
36.000
RECEIVER SIDE
SAFETY LOOP
HINGE SIDE
TWISTED LEAD
22.000
22.000
HPU PAD
CUSTOMER SUPPLIED POWER
2.250
48.000
SEE DETAIL A
CLEAR OPENING
SEE NOTE 2
6.000
A
B
C
D

REFERENCE DESIGNATOR	DEVICE	NUMBER OF WIRES	WIRE GAGE	POWER VOLTAGE
A	2" HYDRAULIC CONDUIT	–	–	–
B	LIMIT SWITCH	2	14	24VDC
C	OPTIONAL HEATER	2	14	120VAC
D	OPTIONAL MAG-LOCK	2	14	12VDC

4.2 Clear Opening View



4.2.1 Table for above Gate Arm Measurements

A	B	C	D
144 [12]	192.458 [16-0 7/16]	164.750 [13-8 3/4]	171.00 [14-3]
156 [13]	210.279 [17-6 1/4]	176.750 [14-8 3/4]	183.00 [15-3]
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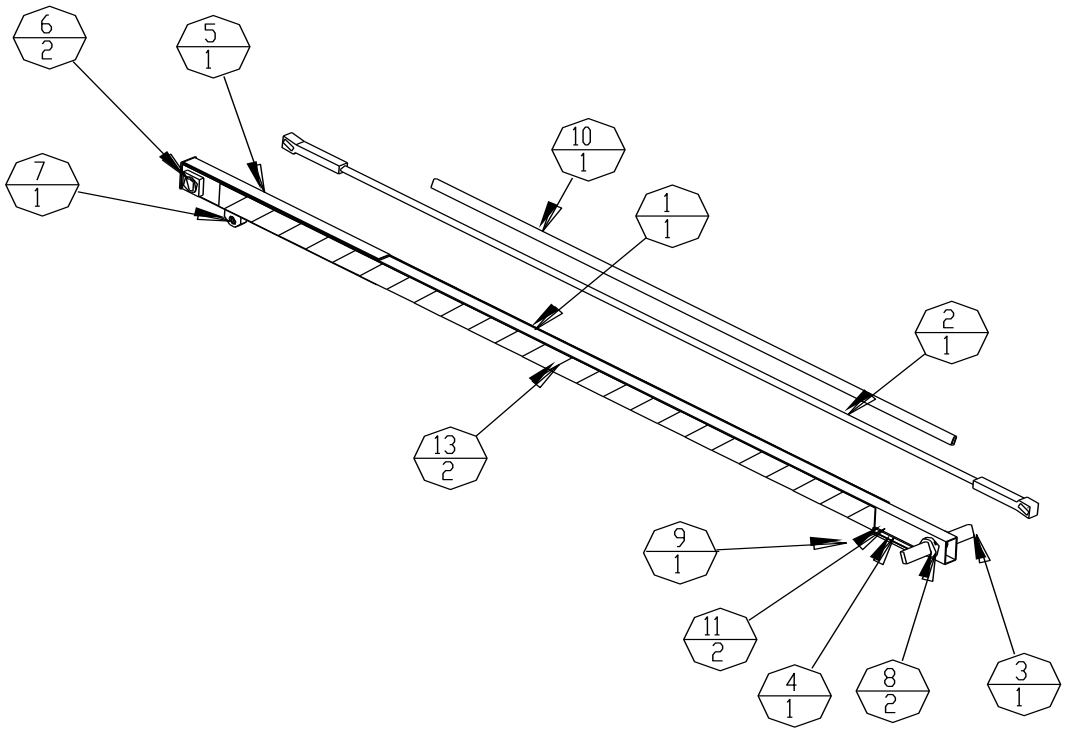
192 [16]	240.624 [20-0 5/8]	212.75 [17-8 3/4]	219.00 [18-3]
204 [17]	252.533 [21-0 9/16]	224.75 [18-8 3/4]	231.00 [19-3]
216 [18]	264.533 [22-0 9/16]	236.75 [19-8 3/4]	243.00 [20-3]
228 [19]	276.487 [23-0 1/2]	248.75 [20-8 3/4]	255.00 [21-3}
240 [20]	288.442 [24-0 7/16]	260.75 [21-8 3/4]	267.00 [22-3]
252 [21]	300.093 [25-0 1/16]	272.75 [22-8 3/4]	289.00 [23-3}
264 [22]	312.093 [26-0 1/16]	284.75 [23-8 3/4]	301.00 [24-3]
276 [23]	324.302 [27-0 3/8]	296.75 [24-8.34	313.00 [25-3]
288 [24]	336.259 [28-0 1/4]	308.75 [25-8 3/4]	325.00 [26-3]
300 [25]	348.213 [29-0 1/4]	320.75 [26-8 3/4]	349.00 [27-3]

4.2.2 Gate Arm Assembly



QTY	FIND NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	NOTES
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2	13	XTAPE-RED-WHITE	REFLECTIVE TAPE, RED/WHITE, ANGLED	
1	12	XTAPE-76675A23	ADHESIVE TAPE, DOUBLE SIDED, 3M VHB	
2	11	XSCR-91771A194	FHP, 8-32 X .5, SST	
1	10	XINS-3W192	INSULATION, PIPE, .875" ID, 1.5" OD	
1	9	XFOAM-86375K153	FOAM PAD, 3/8 THK, ADHESIVE BACK	
2	8	XCOLLAR-32ALUM	2" DIA, LOCKING COLLAR	
1	7	XBRG-EP162016	BEARING-1X125X1	
2	6	XBRG-EF323632	BUSHING, 2X2.25X2	
1	5	0712-3050	RUBBER PAD STEEL SLEEVE	
1	4	0712-3032	712/714 GATE ARM DELRIN PADS	
1	3	0712-3031	RECEIVER PIN MODEL 712-CRASH GATE	
1	2	0712-3018	STEEL CABLE	
1	1	0712-2025	GATE ARM WELDMENT STEEL SLEEVE	